
**Before the
FEDERAL COMMUNICATIONS COMMISSION
Washington, D.C. 20554**

In the Matter of

Update and Refresh of the Wireless Microphones
Proceeding

WT Docket Nos. 08-166, 08-167
ET Docket No. 10-24

Via the ECFS

COMMENTS OF IEEE 802

1. IEEE 802¹ respectfully submits its Comments in the above-captioned Proceeding².
2. IEEE 802, as a leading consensus-based industry standards body, produces standards for wireless networking devices, including wireless local area networks (“WLANs”), wireless personal area networks (“WPANs”), wireless metropolitan area networks (“Wireless MANs”), and wireless regional area networks (“WRANs”). Included in our standards development activity is an emphasis on coexistence, which is the focus of our Wireless Coexistence working group. We appreciate the opportunity to provide these comments to the FCC.

INTRODUCTION

3. On October 5, 2012 the Commission issued Public Notice of a request for refresh of the record of the Wireless Microphones Proceeding, DA 12-1570.
4. IEEE 802 has already published standards and is in the process of completing additional amendments to standards which support operation in the TV broadcast band under the Commission’s Part 15 rules for operation of TV band White Space Devices (“WSDs”). These standards and amendments support applications which include broadband wireless

¹ The IEEE Local and Metropolitan Area Networks Standards Committee (“IEEE 802” or the “LMSC”).

² This document represents the views of IEEE 802. It does not necessarily represent the views of the IEEE as a whole or the IEEE Standards Association as a whole.

access in rural and other areas, wireless local area network operations, including home, business applications and cellular data offload applications, and machine to machine (“M2M”) operations, including smart grid and smart metering applications.

5. As a matter of course, the final disposition of the Commission’s wireless microphone decision making process influences the applicability of IEEE 802 standards to the broadcast TV bands, and, as a result we are submitting these comments on the above proceeding.

IEEE 802 SUGGESTS THAT WIRELESS MICROPHONES SHOULD SWITCH TO A MORE SPECTRALLY EFFICIENT MODULATION

6. Wireless microphones should switch to more spectrally efficient modulation, e.g., high density microphones can accommodate up to 47 active transmitters in one 6 MHz TV Channel with no audio quality degradation. Digital microphones systems are also significantly more resilient to interference than analog versions.^{3 4 5}
7. As part of transition to a more spectrally efficient scheme, we recommend that all wireless microphones be designed to operate on multiple frequencies and in multiple frequency bands.
8. We recommend that the Commission establish a firm timeline for the introduction and deployment of spectrally efficient microphones.
9. Given the cost of replacing the current less spectrally efficient microphones, we encourage the FCC to consider compensating the broadcasters to accelerate the transition.

LICENSED PART 74, AND REGISTERED WIRELESS MICROPHONES USING SPECTRALLY EFFICIENT TECHNOLOGIES SHOULD BE PROTECTED THROUGH DATABASE SERVICE

10. Our statements below are applicable to all the Licensed Part 74 devices including wireless microphones, video assists, communications devices etc.
11. We recommend that the Licensed Part 74 devices and registered microphones using

³ <http://www.shure.com/americas/products/wireless-systems/ulxd-systems>
<http://www.shure.com/americas/products/wireless-systems/ulxd-systems>

⁴ <http://stakeholders.ofcom.org.uk/market-data-research/other/technology-research/research/spectrum-efficiency/spectrum-efficiency-of-wireless/>

⁵ http://www.csr.com/sites/default/files/white-papers/low_bit_rate_audio_coding_for_digital_wireless_microphones.pdf

spectrally efficient technologies are provided protection through the TV Band database service.

12. We further recommend that the Commission establish procedures which prevent Part 74 license holders from reserving spectrum for microphone operation without clear intent to use the spectrum on a regular basis.

LICENSED PART 74 WIRELESS MICROPHONES SHOULD BE ALLOCATED TO A CHANNEL ADJACENT TO THE EXISTING TV CHANNELS, OR IN GUARD BANDS OR IN DUPLEX GAPS

13. According to the FCC Second Memorandum Opinion and Order, the fixed (4W) and portable (100 mW) White Space Devices cannot operate on the channels adjacent to the TV stations in a given geographical area, but they can operate next to a channel containing wireless microphones.
14. It would be spectrally efficient if licensed Part 74 microphones are allocated to the channels adjacent to the current operating TV station channels.
15. We believe that it is reasonable to permit operation of spectrally efficient licensed Part 74 wireless microphones in guard bands or duplex gaps.
16. In case of a frequency agile microphone that has access to a database service, this could be done through a database service itself on an on-demand basis.

WIRELESS MICROPHONES WITH A WAIVER SHOULD BE TREATED LIKE ANY OTHER UNLICENSED WHITE SPACE DEVICE THAT IS PART OF THE DATABASE SERVICE

17. IEEE 802 recommends that a waiver should only be granted to microphones operated at a specific location.
18. Since wireless microphones with a waiver are Part 15 devices, they should abide by the Part 15 rules, where they accept interference, but do not cause interference to others.
19. Part 15 microphones with a waiver should be treated in the same manner as any other unlicensed WSD that operates under the control of the database service.
20. We believe that it is reasonable to permit operation of Part 15 wireless microphones with a waiver in guard bands or duplex gaps.
21. IEEE 802 recommends that a cutoff date be established after which the Commission will no longer accept waiver applications for Part 15 microphones.

**UNLICENSED WIRELESS MICROPHONES WITH NO WAIVER SHOULD NOT BE
ALLOWED TO OPERATE IN THE TV BANDS**

22. Unlicensed wireless microphones with NO waiver should not be allowed to operate in the TV Bands

CONCLUSION

23. IEEE 802 applauds the Commission's work in moving to a final resolution of issues related to wireless microphone operations.
24. IEEE 802 believes that unlicensed use of TVWS spectrum continues to offer opportunities for networks based on WSDs to provide valuable services and new economic opportunities for the consumers and business.

Respectfully submitted,

/s/

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